

**Testimony for the Record**  
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**House Appropriations Subcommittee on Energy and Water Development**  
**May 3, 2017**

NEI is responsible for establishing unified industry policy on regulatory, financial, technical, and legislative issues affecting the commercial nuclear energy industry. NEI has more than 350 members, including all U.S. companies licensed to operate commercial nuclear power plants, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, materials licensees, labor organizations, universities, and the federal contracting companies implementing the DOE EM and NNSA missions and other organizations involved in the nuclear energy sector.

Nuclear energy is the largest and most efficient source of carbon-free electricity in the United States. Currently, 99 reactors in 30 states produce nearly 20 percent of our nation's electricity and approximately 63 percent of our carbon-free electricity. Nuclear energy facilities demonstrate unmatched reliability by operating with an average capacity factor greater than 90 percent—higher than all other electricity sources. Nuclear produces electricity 24/7, regardless of weather and with all its fuel on site for 18-to-24 months. The long horizon for nuclear fuel procurements also means nuclear generation is not subject to price spikes occasionally experienced by other generation sources in recent years.

Nuclear energy facilities are essential to the country's economy and the local communities in which they operate. The typical operating plant generates \$470 million each year in the sale of goods and services in the local community, and employs 700 to 1000 workers. Construction of a new nuclear plant provides in the range of 3500 jobs at peak periods. Collectively, the nuclear industry contributes about \$60 billion every year to the U.S. economy, through supporting over 475,000 jobs and producing over \$12 billion annually in federal and state tax revenues.

The current nuclear fleet is an integral cog in and significant contributor to the nation's infrastructure given its local and national economic value, grid support, reliability, and price stability. Tennessee's 1150-megawatt reactor at Watts Bar II that began operation in October 2016 and the four new reactors under construction in Georgia and South Carolina will likely provide this valuable energy for 80-plus years. And, future nuclear innovations in the form of various advanced design reactors are being developed to meet the needs of our society well into the next century and beyond.

Current operating plants, units now under construction, and plants of the future all must be able to rely on a safety focused, efficient, and technically expert regulator. It is imminently reasonable from the perspective of the industry as well as our nation's energy consumers to expect a

regulatory process with those attributes. Those regulatory attributes are also a national imperative, as they directly affect the ability to maintain the diversity of America's energy portfolio. The industry believes that the NRC's untimely, somewhat outdated, and unnecessarily costly regulatory regime needs updating. The need for Congressional action directing regulatory reform has become more urgent as utilities consider utilizing accident tolerant fuel and NRC applications are being submitted for certification of small modular reactor (SMR) designs, which will be deployed in the mid-2020s, and developers of advanced non-light-water reactors are beginning interactions with the NRC and are looking to deploy their technologies around 2030.

Specifically, the nuclear energy industry makes the following recommendations:

- Exercise oversight of NRC to continue improving the efficiency and transparency of its regulatory processes and operations consistent with its own principles of good regulation without compromising the review schedule for applicants or the shared NRC and industry commitment to safety;
- Oppose reinstating a tax on nuclear power plant operators to pay the cost of decontaminating and decommissioning the federal government's uranium enrichment plants;
- Provide robust funding for the DOE Office of Nuclear Energy's R&D efforts, including public-private partnerships supporting development and commercialization of advanced fuel and reactor technologies, as well as, GAIN initiative;
- Fund NRC to prepare a streamlined, efficient and effective process for addressing accident tolerant fuel and advanced reactors;
- Continue funding for the Energy Innovation Hub for Modeling and Simulation (CASL – Consortium for Advanced Simulation of Light Water Reactors)
- Fund the DOE loan guarantee program for key clean energy technologies as identified by DOE for advanced nuclear power plants and front-end nuclear fuel cycle to ensure global leadership in nuclear innovation particularly when industry finances the cost of the guarantee;
- Provide funding for DOE and NRC to complete the licensing of the proposed Yucca Mountain repository in parallel with developing a consolidated storage facility;
- Fund completion of the Mixed Oxide (MOX) Fuel Facility at the Savannah River Site;
- Provide for cleanup of legacy waste from the Manhattan Project and Cold War nuclear weapons production with predictable and meaningful funding;
- Fund modernization of the nuclear security enterprise to meet requirements for the nation's nuclear deterrent and U.S. Navy nuclear propulsion;
- Retain the Integrated University Program at DOE and NRC;
- Fund Idaho National Lab infrastructure to support vital research

### **Nuclear Regulatory Commission**

While it is essential that current operating plants, and plants of the future all rely on a safety focused, efficient, and technically expert regulator, we believe that the NRC's untimely, somewhat outdated, and unnecessarily costly regulatory regime needs updating. Thanks to the oversight of this Subcommittee, NRC's timely and efficient processing of licensing actions, readiness to review second license renewal applications, adherence to the backfit rule in rulemakings and the efficient and predictable transition to digital instrumentation and control systems and advanced nuclear fuels is receiving the needed attention to modernize and reform

NRC. And the recommendations of Congressionally-directed independent assessments and the Project Aim report emphasizes the need for NRC to continue improving the efficiency and transparency of its regulatory processes and operations consistent with its own principles of good regulation.

Additionally, the NRC should dedicate resources to prepare for efficiently and effectively reviewing the advanced technologies of accident tolerant fuel and advanced reactor applications. The dedication of resources to these next generation technologies are consistent with NRC's own Project Aim 2020 Report, "Achieving Exemplary Nuclear Regulation in the 21<sup>st</sup> Century" which states, "Over the next five years, gradual shifts in technologies, safety issues, and security threats are expected, which will drive some shifts in the workforce. Such growth can be offset by contractions in other disciplines that are less in demand." In support of these efforts, the industry encourages funding to NRC for non-fee billable accident tolerant fuel and advanced reactor activities.

### **Uranium Enrichment D&D Tax**

While the industry fully supports the complete decontamination and decommissioning of the gaseous diffusion plants, NEI strongly opposes any recommendation to reinstate a uranium enrichment decontamination and decommissioning tax on the industry. Producers and consumers of electricity should not be forced to bear the additional financial burden of this unwarranted tax since the industry has already paid in full its share of the cleanup costs—first as part of the price for government uranium enrichment services and again as required by the Energy Policy Act of 1992. Under the 1992 law, the tax on electric utilities was to end after 15 years or the collection of \$2.25 billion, adjusted for inflation. The three uranium enrichment plants in question operated for 25 years as Department of Defense facilities and were irretrievably contaminated long before any sales of enrichment services to the commercial nuclear industry.

### **Current Fleet of Nuclear Reactors**

By 2030, the United States could experience electricity shortages if a significant number of nuclear plants are retired in a short period. One way to avoid this outcome is renewing the operating licenses of nuclear power plants a second time for an additional 20 years. The existing fleet of reactors is preparing for this life-extension beyond 60 years to 80 years of operations. Two reactors have already announced plans to seek a license renewal from NRC. While DOE's work in this area has been instrumental in enabling these life extensions, additional work is still necessary through the Light Water Reactor Sustainability program. The industry, with the support of the DOE, is actively working on R&D that can reduce the operating cost of the existing fleet. This includes work in advanced instrumentation and controls and the accident tolerant fuel program. Both of these R&D efforts support the ongoing efforts of the industry to improve the cost-competitiveness of the fleet and preserve this national asset. Increasing funding for DOE's accident tolerant fuel program will enable the R&D to be accelerated and lead test rods to be inserted into commercial reactors in 2018/2019, significantly ahead of the current schedule. In addition to these programs, funding for the Energy Innovation Hub for Modeling

and Simulation, CASL – Consortium for Advanced Simulation of Light Water Reactor, should be continued. CASL is successfully developing tools that support the operating fleet as well as supporting the development of accident tolerant fuels.

### **Small Modular Reactors (SMRs)**

The SMR Licensing and Technical Support (LTS) program has successfully supported SMR activities to date. The NuScale design certification application has recently been docketed by NRC and TVA's early site permit application was docketed last year. The support for SMR development cannot end with these early successes. The SMR LTS program should be continued beyond FY 2017 and expanded to support first-of-a-kind engineering work. Continued investment by the federal government as a cost-sharing partner is necessary and prudent to ensure the first generation of economically competitive SMRs are deployed in the mid-2020s.

Developing this technology will help U.S. companies claim a large portion of the international market for smaller, carbon-free energy sources. SMRs will provide domestic energy companies with an additional low-carbon electric generating option as they respond to changes in market forces and will complement the large passively safe light water reactors being built in Georgia and South Carolina. Given the benefits to domestic job creation, export value, reliable and domestic clean electricity supply, federal investment in the development of SMR technology today is an investment in our nation's future.

### **Advanced Reactor and Fuel Cycle Technologies**

The ability of the nuclear industry to continue to innovate and build advanced technologies depends on the federal government supporting demonstration projects and encouraging new research.

NEI supports programs managed by DOE's Office of Nuclear Energy that seek to accelerate the commercial use of new non-light water reactor technologies. The Gateway for Accelerated Innovation in Nuclear (GAIN) has been very beneficial in expanding access to the U.S. national laboratories for advanced reactor companies. The small business voucher program, implemented last year, was very successful and well received by industry. A second round of awards was announced earlier this year and this program should be continued and expanded.

The advanced reactor industry has formed three technology specific reactor working groups: molten salt reactors, fast reactors, and high-temperature gas reactor to focus on R&D needs and interface with GAIN to inform DOE R&D. Continued and increased funding for the DOE advanced reactor R&D program is essential to foster the ongoing and timely development and commercialization of advanced reactors. Also essential is the continuation of funding for the industry cost-shared awards supporting the development of two advanced reactor concepts.

While the U.S. has world leading national laboratories, it lacks a fast neutron test reactor user facility. Such a facility would enable companies to accelerate testing thereby accelerating the commercialization of their technology. A U.S. facility would also obviate the need for U.S.

companies to utilize a Russian research reactor. Therefore, NEI supports funding the DOE to establish a versatile fast-neutron test capability, to be operational within ten years.

### **Used Nuclear Fuel Management**

With respect to used nuclear fuel management, NEI supports funding for DOE and NRC to complete the licensing of the proposed Yucca Mountain repository in parallel with developing a consolidated storage facility consistent with the industry's proposed integrated used nuclear fuel management strategy as adopted by NEI in November 2015. We encourage the Congress to restructure the funding and spending mechanisms for the Nuclear Waste Fund to provide the necessary certainty to implement the program. This should include dependable access to the Nuclear Waste Fund while maintaining effective Congressional oversight. Such action is essential to ensuring that the federal government can meet its statutory and contractual commitments.

### **Mixed-Oxide (MOX) Fuel Fabrication Facility**

NEI supports funding for the timely completion and operation of the (MOX) Fuel Fabrication Facility at the Savannah River Site. Construction of the MOX facility is 70 percent complete, employs 1,800 people directly and uses more than 4,000 American contractors and suppliers in 43 states. Under the Plutonium Management Disposition Agreement, the U.S. committed to transform 34 metric tons of U.S. weapons-grade plutonium (enough plutonium for 17,000 nuclear weapons) into fuel for commercial power reactors.

### **Environmental Management (EM)**

NEI supports DOE's mission to complete the safe cleanup of legacy sites resulting from decades of nuclear weapons development and government-sponsored nuclear technology research. The DOE has a legal and moral obligation to clean up the sites and the mission of EM should have the commensurate level of increased funding to match increased work scope. NEI commends the EM funding level of \$6.5 billion in the President's FY 2018 budget blueprint including direction to address "excess facilities to support modernization of the nuclear security enterprise." NEI also commends EM's significant footprint reduction to date and the re-start of WIPP, which is critical to the TRU waste program and impacts progress at legacy sites across the country.

Adequate and reliable funding is essential for the Department to address the significant challenges ahead and to meet its commitments to affected communities and states. The EM program relies on an array of contractors to carry out its diverse cleanup mission. It is critical that the Department work in concert with industry to identify barriers to the effective execution of its objectives: risk reduction and the successful planning, construction and operation of large, often first-of-a-kind projects and facilities.